

ABSTRACT

A textile substrate is provided which is coated with a film comprising iron (III) oxide hydroxide and aluminum oxide hydroxide. This film or coating is formed by contacting the textile substrate with an aqueous solution comprising ferrous or ferric salts and aluminum salts. The iron (II), iron (III), and aluminum ions are hydrolyzed and the iron (II) ions are also oxidized under controlled conditions. These hydrolyzed species then, it is believed, coprecipitate or copolymerize to on the textile surface to form a smooth, coherent, substantially amorphous iron (III) oxide/aluminum oxide hydroxide film or coating on the surface of the substrate without forming an insoluble iron (III) or aluminum hydroxide precipitate in the solution. This is accomplished by controlling the reaction conditions such that the rates of adsorption onto the substrate surface of both iron (III) and aluminum oxide hydroxides are greater than the rates of formation of said same oxide hydroxide particles. The resultant coating is substantially amorphous with extremely limited crystalline formation. The obtained substrate has very good color fastness, bacteriostatic, and virus removing properties and can be utilized as an inexpensive and effective water filtration article.